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Review Date: 9/30/98	Classification Change: U
Authority: ADD	Contains No DOE Classified Information
Name: P. Kramer	Coordinate With:
2nd Review Date: 10/06/98	Contains UCNI: no
Authority: ADD	Comments:
Name: W Layne	DECLASSIFY

TCG-NNT-1; TCG-WI-1

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SEP 23 1965

CENTRAL TECH FILE

T-29525 SEP 22 1965 File: MC1238, 3-2

PROGRAM	CATEGORY	ORG.	DATE
1 1 2 3 8	3 0 2 1 3	2 1 1	6 5 6 9

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ENVIRONMENTAL TESTING OF EIGHT MC1238 (XXI-B) NEUTRON TUBES (U)

Organization 7300 Environmental Test Report

CENTRAL TECHNICAL FILE	
ACCOUNTABILITY CARD	✓
FILE NO. MC	1238
	3-2

880

A. U. Chavez, 7332

Approved by: Gordon P. Barnett
Project Leader, 7332

SANDIA SYSTEMATIC DECLASSIFICATION REVIEW DOWNGRADING OR DECLASSIFICATION STAMP	
CLASSIFICATION CHANGED TO: U	AUTHORITY: W C Layne
Emelda Selph 10/06/98	RECORD ID: 99SN0060
PERSON CHANGING MARKING & DATE: W. C. Layne 10/12/98	
PERSON VERIFYING MARKING & DATE	DATED: 10/06/98

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T-29525

ENVIRONMENTAL TESTING OF EIGHT MC1238 (XXI-B) NEUTRON TUBES

Introduction

The object of this test was to assist Division 1413 in confirming the structural design of these tubes.

Environmental testing was done in accordance with a memorandum dated May 5, 1965 to M. A. Richter, 7332, from E. G. Franzak, 1413.

The MC1238 tubes were subjected to temperature shock, four tubes to vibration at +180°F, and four to vibration at room temperature. All the tubes were subjected to High g entry shock.

This test was requested by R. H. Opperman, 1413, on May 7, 1965. E. D. Graves, 7332, was the Test Project Engineer and A. U. Chavez, 7332, was the Test Coordinator. The test items were received June 7, 1965, and the test was completed August 20, 1965.

Summary

Eight MC1238 neutron tubes were submitted for environmental testing.

The specified environments wo which the MC1238 (XXI-B) tubes were subjected, were temperature cycling, vibration at room temperature, vibration at +180°F and High g entry shock, in that order.

Procedure and Results

The MC1238 (XXI-B) tubes were subjected to the specified environments listed in the following tables:

Table I

Sequence of Environments	Tube Number							
	1	2	3	4	5	6	7	8
Temperature Cycling	X	X	X	X	X	X	X	X
Vibration at Room Temperature	X		X		X		X	
Vibration at +180°F		X		X		X		X
High g Entry Shock	X	X	X	X	X	X	X	X

For identifying the tubes in the table, the following numbers were assigned to each tube serial number:

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Tube Number	Tube Serial Number
1	M5119
2	M5907
3	M9189
4	M9254
5	1195-0-54
6	1105-0-790
7	2165334
8	2185068

Temperature Cycling

All of the MC1238 tubes were subjected to temperature cycling with less than five minutes transfer time between temperatures as follows:

Temperature (°F)	Time (hrs)
-80°	2
Room Temperature	½
+200	2
Room Temperature	½
-80	2
Room Temperature	16½
+200	1½
Room Temperature	½
-80	1½
Room Temperature	½
+200	1½

After this environment the tube indicated no damage. Electrical measurements were made and retained by Division 1413.

Vibration at Room Temperature

Tube Nos. 1, 2, 5 and 7 were mounted on a vibration fixture (see Figure 1) and subjected to vibration at room temperature as follows:

Frequency (cps)	Double Amplitude or Constant Acceleration
10-73	0.036 Inch DA
73-2000	10 g

Vibration was applied along each of the three major perpendicular axes of the tube (see Figure 1). This was accomplished in 30 minute cycles along each axis.

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No visual damage was noted during or after this environment.

Electrical measurements after this environment were made by Division 1413.

Vibration at +180°F

Tube Nos. 2, 4, 6 and 8 were mounted on a vibration fixture (see Figure 1) and subjected to vibration using the same inputs and frequency range as used during vibration at room temperature. Vibration was applied along each of the three major perpendicular axes of the tubes, and was accomplished in 30 minute cycles along each axis. No visual damage was noted during or after this environment.

Electrical measurements were made at room temperature after vibration and were retained by Division 1413.

High g Entry Shock

All the tubes were subjected to one mechanical shock pulse in each direction of the three major mutually perpendicular axes of the tube (see Figure 1). The pulses were triangular in shape with an amplitude of 2000 g and a time duration ranging from 1.49 to 1.51 milliseconds.

Electrical measurements were made after the first shock pulse, in the X1 direction of the tubes (see Figure 1). Measurements and results were retained by Division 1413.

Shocks in the opposite direction (X2) (see Figure 1) along the longitudinal axis caused two tubes to come off the fixture; however, this did not result in any damage. In anticipation of this problem some nylon tape had been used to catch the tubes. The tubes were again mounted on the fixture and shocked in the remaining five directions. No visual damage was noted after this environment. The tubes were returned to Division 1413 for final electrical measurements. Data and results were retained by Division 1413.

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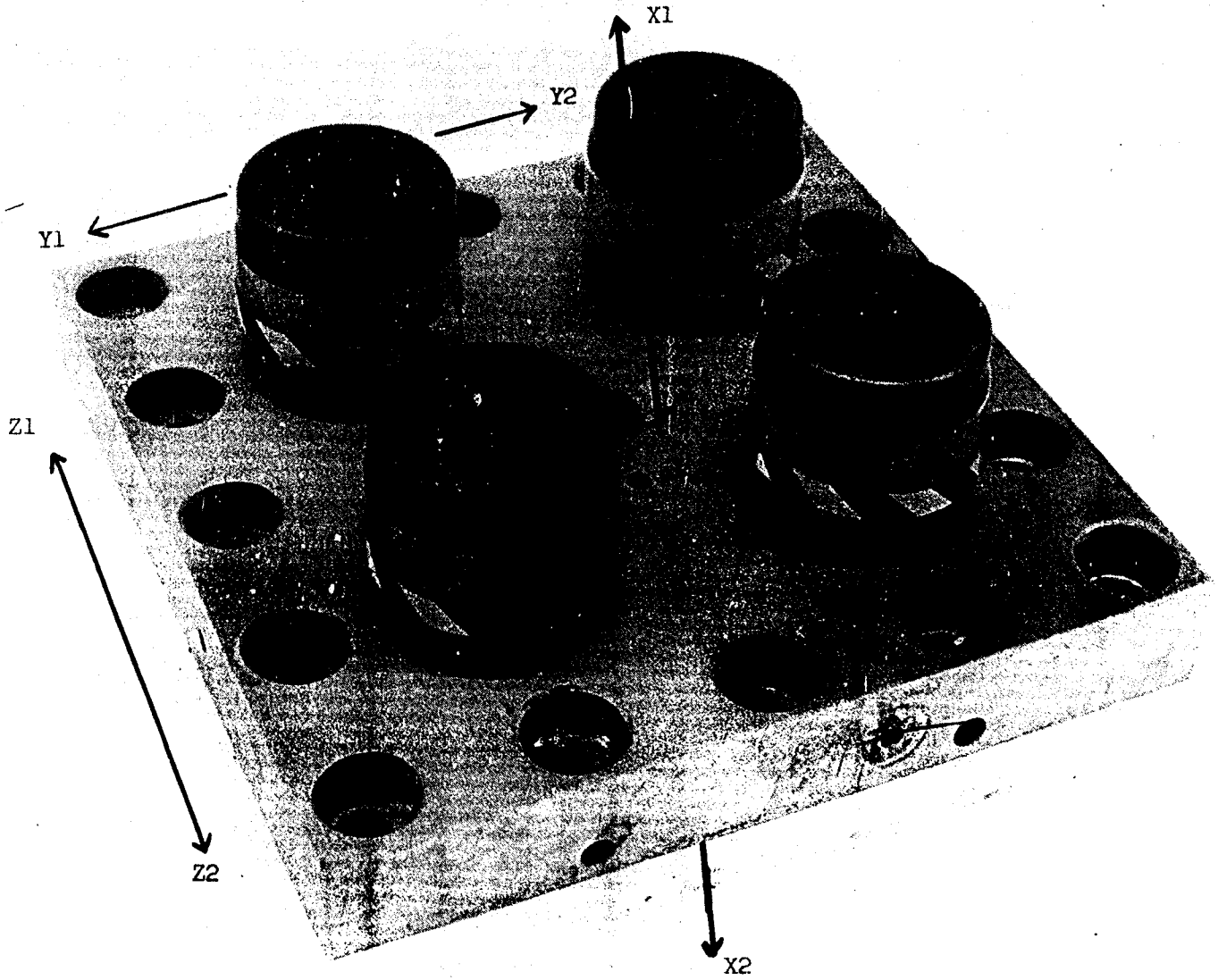

FIGURE
SHOWING THE DIRECTIONS OF APPLIED FORCE

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